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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/529,192	06/26/2000	THOMAS JUNG	SPM-290-A	9266

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EXAMINER	
MARKHAM, WESLEY D	
ART UNIT	**PAPER NUMBER**
1762	

DATE MAILED: 04/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/529,192	JUNG ET AL.	
	Examiner	Art Unit	
	Wesley D Markham	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,5-9 and 12-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,6-9,12-17,21-30,32,34 and 35* is/are rejected.

7)☒ Claim(s) *5,18-20,31,33 and 36* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 June 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Acknowledgement is made of the response filed by the applicant on 12/23/2003. Claims 1, 5 – 9, and 12 – 36 are currently pending in U.S. Application Serial No. 09/529,192, and an Office Action on the merits follows.

Information Disclosure Statement

2. The information disclosure statement filed on 10/22/2002 as paper #21 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language, specifically documents (1) EP 0 879 897 A1 and (2) DD 294 511 A5. The IDS has been placed in the application file, but the aforementioned two documents have not been considered.

Drawings

3. The drawings (2 sheets, 4 figures) filed on 6/26/2000 are approved by the examiner.

Claim Rejections - 35 USC § 112 / Response to Arguments

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. The rejection of Claims 24 and 34 – 36 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement for containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention, set forth in paragraph 10 of the previous Office Action (i.e., the non-final Office Action mailed on 10/3/2003), is withdrawn in light of the applicant's remarks filed on 12/23/2003 (see the **REMARKS** section on page 9 of the response).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order

for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 23, 24, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukui et al. (USPN 4,894,546) in view of Martin et al. (USPN 6,027,663) and Eriksson (USPN 4,508,053).

9. Regarding independent **Claim 23**, Fukui et al. teaches a process for sputtering and ionizing (i.e., surface treatment of) a hollow cathode (i.e., a substrate) (Col.6, lines 20 – 25), the substrate being made of metal such as Mo, W, Ni, and the like (i.e., being "electrically conducting") (Col.5, lines 28 – 44), the process comprising the steps of placing a gas inside the hollow cathode substrate (i.e., in the region of an electric discharge), restricting the discharge on all sides (i.e., on at least two sides) by a cylindrical hollow cathode (i.e., by substrate surfaces to be treated, wherein the substrate surfaces form a hollow cathode, and treating the inside of the hollow cathode (i.e., the substrate surfaces) by hollow cathode glow discharge, the discharge being activated by a "suitable discharge voltage" applied between the hollow cathode body and the anode(s) (Abstract, Figures 1 – 4, Col.1, lines 5 – 14, Col.2, lines 38 – 68, Col.3, lines 1 – 18, Col.4, lines 25 – 68, Col.5, Col.6, lines 1 – 25, Col.7, lines 1 – 5, and Col.8, lines 1 – 18). Fukui et al. does not explicitly teach that elements of the surface treating process, specifically means for placing gas in the region and means for removing the gas from the region, are integrated outside of the discharge region. However, Fukui et al. does teach that the hollow cathode has

at least one opening for introducing a gas into one end of the hollow cathode and another opening to extract the gaseous ions generated by the discharge from the other end of the hollow cathode (see Figures 1 – 4, Col.2, lines 38 – 68, Col.4, lines 25 – 49). Fukui et al. does not teach, mention, or suggest that the means for introducing the gas into the hollow cathode and/or the means for removing gas from the region are located within the discharge region. Therefore, it would have been obvious to one of ordinary skill in the art to locate the gas introduction and removal means outside of the discharge region with the reasonable expectation of (1) success, as it is clear from the teachings of Fukui et al. that gas is introduced and removed from the region in general, and Fukui et al. does not teach, mention, or suggest that the means for introducing the gas into the hollow cathode and/or the means for removing gas from the region are located within the discharge region, and (2) obtaining the benefits of locating the aforementioned gas introduction and removal means outside the discharge region, such as not subjecting the aforementioned means to sputtering and/or ionization due to locating the means within the discharge region (Col.6, lines 20 – 25). Additionally, Fukui et al. does not explicitly teach that the "suitable discharge voltage" is at least one of a DC voltage, a pulsed DC voltage, and AC voltage, and microwaves. Specifically, Fukui et al. is silent regarding the type of discharge voltage used. Martin et al. teaches that a DC voltage is typically used to activate hollow cathode glow discharge processes (Col.4, lines 18 – 67, Col.6, lines 1 – 29). Eriksson teaches that an AC voltage provides a uniform glow discharge in a hollow cathode glow discharge process (Col.2, lines 53

– 60, Col.3, lines 56 – 60, and Col.5, lines 34 – 54). Therefore, it would have been obvious to one of ordinary skill in the art to utilize either a DC voltage or an AC voltage as the "suitable discharge voltage" in the process of Fukui et al. with the reasonable expectation of successfully and advantageously using a specific, well-known species of hollow cathode discharge voltages (i.e., AC or DC) out of the broader genus of discharge voltages generally taught by Fukui et al.

10. Regarding independent **Claim 24**, Fukui et al. teaches a device for sputtering and ionizing (i.e., surface treatment of) a hollow cathode (i.e., a substrate) (Col.6, lines 20 – 25), the substrate being made of metal such as Mo, W, Ni, and the like (i.e., being "electrically conducting") (Col.5, lines 28 – 44), the device comprising at least one hollow cathode (i.e., substrate) defining a discharge region enclosed on all sides (i.e., on at least two sides) by a cylindrical hollow cathode (i.e., by substrate surfaces to be treated), means for supplying a "suitable discharge voltage" (i.e., electrical energy) to the discharge region, and an anode proximate to the at least one substrate, wherein the substrate surfaces form a hollow cathode and wherein the substrate surfaces are treated by hollow cathode glow discharge activated by the suitable activating voltage, wherein the anode(s) is/are integrated outside of the discharge region (Abstract, Figures 1 – 4, Col.1, lines 5 – 14, Col.2, lines 38 – 68, Col.3, lines 1 – 18, Col.4, lines 25 – 68, Col.5, Col.6, lines 1 – 25, Col.7, lines 1 – 5, and Col.8, lines 1 – 18). Additionally, Fukui et al. teaches that the hollow cathode ion source is "for in a vacuum chamber" (Abstract, Col.2, lines 38 – 40). Therefore, the device of Fukui et al. includes a vacuum chamber to enclose the hollow cathode

(i.e., the discharge region), as claimed by the applicant. Fukui et al. does not explicitly teach that the device comprises means for supplying gas to and removing gas from the vacuum chamber, wherein the aforementioned means are integrated outside of the discharge region. However, Fukui et al. teaches that the hollow cathode ion source is "for in a vacuum chamber" (Abstract, Col.2, lines 38 – 40), should be maintained under a high degree of vacuum (Col.6, lines 4 – 7), and has at least one opening for introducing a gas into one end of the hollow cathode and another opening to extract the gaseous ions generated by the discharge from the other end of the hollow cathode (see Figures 1 – 4, Col.2, lines 38 – 68, Col.4, lines 25 – 49). Fukui et al. does not teach, mention, or suggest that the means for introducing the gas into the hollow cathode in the vacuum chamber and/or the means for removing gas from the region / vacuum chamber are located within the discharge region. Therefore, it would have been obvious to one of ordinary skill in the art to locate the gas introduction and removal means outside of the discharge region with the reasonable expectation of (1) success, as it is clear from the teachings of Fukui et al. that gas is introduced and removed from the region in general, and Fukui et al. does not teach, mention, or suggest that the means for introducing the gas into the hollow cathode and/or the means for removing gas from the region are located within the discharge region, and (2) obtaining the benefits of locating the aforementioned gas introduction and removal means outside the discharge region, such as not subjecting the aforementioned means to sputtering and/or ionization due to locating the means within the discharge region (Col.6, lines

20 – 25). Additionally, Fukui et al. does not explicitly teach that the "suitable discharge voltage" is at least one of a DC voltage, a pulsed DC voltage, and AC voltage, and microwaves. Specifically, Fukui et al. is silent regarding the type of discharge voltage used. Martin et al. teaches that a DC voltage is typically used to activate hollow cathode glow discharge processes (Col.4, lines 18 – 67, Col.6, lines 1 – 29). Eriksson teaches that an AC voltage provides a uniform glow discharge in a hollow cathode glow discharge process (Col.2, lines 53 – 60, Col.3, lines 56 – 60, and Col.5, lines 34 – 54). Therefore, it would have been obvious to one of ordinary skill in the art to utilize either a DC voltage or an AC voltage as the "suitable discharge voltage" in the device of Fukui et al. with the reasonable expectation of successfully and advantageously using a specific, well-known species of hollow cathode discharge voltages (i.e., AC or DC) out of the broader genus of discharge voltages generally taught by Fukui et al. Regarding **Claim 34**, the combination of Fukui et al., Martin et al., and Eriksson also teaches that the discharge is activated by a DC voltage (see the discussion of Claim 24 above).

11. Claims 1, 7, 9, 12 – 17, 26, 27, 29, 30, 32, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukui et al. (USPN 4,894,546) in view of Martin et al. (USPN 6,027,663) and Eriksson (USPN 4,508,053), in further view of Jung (DE 4235953 A1).
12. The combination of Fukui et al., Martin et al., and Eriksson teaches all the limitations of **Claim 1** as set forth above in paragraph 9, except for a method wherein the

surfaces to be treated (i.e., the hollow cathode) are supplied by one of two flat, parallel substrates and at least one continuously moving band-shaped substrate. Specifically, the hollow cathode used in the process / device of Fukui et al. is cylindrical. Jung teaches that, in the art of hollow cathodes, a linear hollow cathode consisting of planar, parallel targets of the same or similar size (i.e., two flat, parallel substrates) is simple, inexpensive, and has a planar construction that facilitates target (i.e., hollow cathode) cooling (Abstract, Figures 5 – 7). Therefore, it would have been obvious to one of ordinary skill in the art to utilize two flat, parallel substrates as the hollow cathode in the process / device of the combination of Fukui et al., Martin et al., and Eriksson (as opposed to a cylindrical hollow cathode) with the reasonable expectation of successfully and advantageously using a hollow cathode arrangement that is simple, inexpensive, and has a planar construction that facilitates target (i.e., hollow cathode) cooling. This cooling facilitation of the hollow cathode taught by Jung would clearly be beneficial in the process / device of Fukui et al., as Fukui et al. is directly concerned with cooling the hollow cathode (Col.3, lines 15 – 34, Col.4, lines 37 – 42).

13. The combination of Fukui et al., Martin et al., and Eriksson teaches all the limitations of **Claim 14** as set forth above in paragraph 10, except for a device wherein the surfaces to be treated (i.e., the hollow cathode) are supplied by one of two flat, parallel substrates and at least one continuously moving band-shaped substrate. Specifically, the hollow cathode used in the process / device of Fukui et al. is cylindrical. Jung teaches that, in the art of hollow cathodes, a linear hollow cathode

consisting of planar, parallel targets of the same or similar size (i.e., two flat, parallel substrates) is simple, inexpensive, and has a planar construction that facilitates target (i.e., hollow cathode) cooling (Abstract, Figures 5 – 7). Therefore, it would have been obvious to one of ordinary skill in the art to utilize two flat, parallel substrates as the hollow cathode in the process / device of the combination of Fukui et al., Martin et al., and Eriksson (as opposed to a cylindrical hollow cathode) with the reasonable expectation of successfully and advantageously using a hollow cathode arrangement that is simple, inexpensive, and has a planar construction that facilitates target (i.e., hollow cathode) cooling. This cooling facilitation of the hollow cathode taught by Jung would clearly be beneficial in the process / device of Fukui et al., as Fukui et al. is directly concerned with cooling the hollow cathode (Col.3, lines 15 – 34, Col.4, lines 37 – 42).

14. The combination of Fukui et al., Martin et al., Eriksson, and Jung also teaches all the limitations of **Claims 7, 9, 12, 13, 15 - 17, 26, 27, 29, 30, 32, and 35** as set forth above in paragraphs 9, 10, 12, and 13 and below, including a method / device wherein / further comprising:

- Claim 7: The electric discharge occurs at a pressure between 0.01 mbar and 100 mbar (Col.9, lines 25 – 30 of Martin et al., Col.5, lines 40 – 41 of Eriksson).
- Claim 9: A voltage between the at least one substrate (i.e., the hollow cathode) and a plasma formed by the electric discharge is between one and 3000 V (Col.9, lines 28 – 30 of Martin et al., Col.5, lines 41 – 47 of Eriksson).

- Claims 12, 13, 16, and 17: The placing step (means) and removing step (means) comprise feeding the gas into (a gas supply arranged in) one of the discharge region and an area immediately outside the discharge region and removing gas from (means for gas removal arranged in) one of the discharge region and an area immediately outside the discharge region, respectively. Specifically, Fukui et al. teaches that the hollow cathode has at least one opening for introducing a gas into one end of the hollow cathode and another opening to extract the gaseous ions generated by the discharge from the other end of the hollow cathode (see Figures 1 – 4, Col.2, lines 38 – 68, Col.4, lines 25 – 49). This is equivalent to feeding the gas into one of the discharge region and an area immediately outside the discharge region and removing gas from one of the discharge region and an area immediately outside the discharge region, and the associated means for doing so, as claimed by the applicant. For further discussion, see paragraphs 9, 10, 12, and 13 above.
- Claim 15: Means for cooling the at least one substrate (Abstract, Figures 1 – 4, Col.4, lines 34 – 42, Col.5, lines 28 – 32 of Fukui et al.; Abstract of Jung).
- Claims 26 and 29: The hollow cathode glow discharge activating voltage is a DC voltage (Col.4, lines 18 – 67, Col.6, lines 1 – 29 of Martin et al.).
- Claims 27, 30, 32, and 35: The at least one substrate comprises at least one band-shaped substrate, and the restricting step comprises restricting the discharge region on two opposed, parallel sides by the at least one band

shaped substrate. Specifically, the combination of Fukui et al., Martin et al., Eriksson, and Jung reasonably suggests forming the hollow cathode (i.e., the substrate(s) enclosing the discharge region) out of two planar, parallel targets of the same of similar size (see paragraphs 12 and 13 above). This is equivalent to restricting the discharge region on two opposed, parallel sides by two (i.e., "at least one") band shaped substrates.

15. Claims 6, 25, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukui et al. (USPN 4,894,546) in view of Martin et al. (USPN 6,027,663) and Eriksson (USPN 4,508,053), in further view of Jung (DE 4235953 A1), and in further view of either Fuke (USPN 4,794,612) or Kohler et al. (USPN 5,286,534).

16. The combination of Fukui et al., Martin et al., Eriksson, and Jung teaches all the limitations of **Claims 6, 25, and 28** as set forth above in paragraphs 12 and 13, except for a method / device wherein the discharge region is restricted on two sides by substrate surfaces (i.e., the hollow cathode surfaces) at a distance of 1 mm to 50 cm apart (Claim 6), particularly 1 to 10 cm (Claims 25 and 28). Specifically, the combination of Fukui et al., Martin et al., Eriksson, and Jung is silent regarding the spacing between the substrate surfaces. As such, one of ordinary skill in the art would be motivated to seek out an appropriate spacing distance to achieve a hollow cathode glow discharge. Both Fuke (Col.4, lines 26 – 31) and Kohler et al. (Col.5, lines 9 – 25, Col.11, lines 44 – 45) teach that hollow cathodes typically have a diameter within the range of distances claimed by the applicant. Therefore, it would

have been obvious to one of ordinary skill in the art to space the hollow cathode substrates of the combination of Fukui et al., Martin et al., Eriksson, and Jung at a distance of between 1 to 10 cm apart (as claimed by the applicant) because this distance / diameter is known to be sufficient and operable to achieve a hollow cathode glow discharge, which is explicitly desired by the combination of Fukui et al., Martin et al., Eriksson, and Jung.

17. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukui et al. (USPN 4,894,546) in view of Martin et al. (USPN 6,027,663) and Eriksson (USPN 4,508,053), in further view of Jung (DE 4235953 A1), and in further view of either Mikalesen et al. (USPN 4,824,544) or Chodil (USPN 3,999,094).

18. The combination of Fukui et al., Martin et al., Eriksson, and Jung teaches all the limitations of **Claim 8** as set forth above in paragraph 12, except for a process wherein the at least one substrate is at ground potential. Specifically, Fukui et al. teaches that a discharge voltage is applied between the hollow cathode (i.e., substrate) and the anode(s) (Figures 2 and 3, Col.5, lines 66 – 68, Col.6, line 1). Both Mikalesen et al. (Col.5, lines 66 – 68, Col.6, lines 1 – 3) and Chodil (Col.2, lines 45 – 53) teach that a hollow cathode glow discharge can be activated in a case wherein the hollow cathode is grounded. In this situation, the hollow cathode requires no power supply at all to operate, but the anode must be powered (Col.6, lines 1 – 3 of Mikalesen et al.). It would have been obvious to one of ordinary skill in the art to ground the hollow cathode substrate(s) of the combination of Fukui et al.,

Martin et al., Eriksson, and Jung, as taught by either Mikalesen et al. or Chodil, with the reasonable expectation of successfully and advantageously activating the hollow cathode glow discharge (i.e., achieving similar results), regardless of whether the cathode is powered or grounded. Additionally, by grounding the hollow cathode, one of ordinary skill in the art would have beneficially eliminated the need for a power supply to operate the aforementioned cathode.

19. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukui et al. (USPN 4,894,546) in view of Martin et al. (USPN 6,027,663) and Eriksson (USPN 4,508,053), in further view of Jung (DE 4235953 A1), and in further view of Helmer et al. (USPN 5,482,611).

20. The combination of Fukui et al., Martin et al., Eriksson, and Jung teaches all the limitations of **Claims 21 and 22** as set forth above in paragraph 13, except for the deflection elements arranged in the vacuum chamber, in a region of a device component in which parasitic discharges could be formed due to potentials of the device component and around the at least one substrate and the discharge region (i.e., in the region of the sides of the discharge region not restricted by substrate surfaces), wherein the deflection elements are electrically isolated from the substrate (i.e., hollow cathode) and the device component. However, Helmer et al. teaches that it was known in the art of hollow cathodes at the time of the applicant's invention to arrange walls / screens (i.e., "deflection elements") isolated from the hollow cathode and device components in a region in which parasitic discharges could be

formed in order to suppress such discharges (Figure 1C, Col.4, lines 29 – 46, Col.6, lines 13 – 45, Col.7, lines 34 – 44). Therefore, it would have been obvious to one of ordinary skill in the art to arrange the appropriate electrically-isolated deflection elements in the device of the combination of Fukui et al., Martin et al., Eriksson, and Jung wherever parasitic discharges could be formed with the reasonable expectation of successfully and advantageously suppressing these unwanted discharges.

Allowable Subject Matter

21. **Claims 5, 18 – 20, 31, 33, and 36** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

22. The following is a statement of reasons for the indication of allowable subject matter: Claims 5, 18 – 20, 31, 33, and 36 all require that the substrate in the method / device be a continuously moving or running band-shaped substrate and/or that the band-shaped substrate be supported by at least one roller located outside the discharge region. The prior art of record, alone or in combination, does not teach or suggest this limitation in conjunction with the applicant's claimed hollow-cathode glow discharge method or device.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesley D Markham whose telephone number is (571)

272-1422. The examiner can normally be reached on Monday - Friday, 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (571) 272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wesley D Markham
Examiner
Art Unit 1762

WDM

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